

عنوان مقاله:

A Planar, Layered Ultra-wideband Metamaterial Absorber for Microwave Frequencies

محل انتشار:

ماهنامه بین المللی مهندسی، دوره 30، شماره 3 (سال: 1395)

تعداد صفحات اصل مقاله: 6

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خلاصه مقاله:

In this paper, an ultra-wideband metamaterial absorber is designed and simulated. The proposed absorber is planar and low profile. It is made of a copper sheet coated with two dielectric layers. Each unit cell of the metamaterial structure is composed of multiple metallic split rings, which are patterned on the top and middle boundaries of the dielectrics. The designed absorber utilizes different resonances of the split rings with non-identical parameters. In order to achieve ultra-wideband absorption, dimensions of the rings are designed to represent dissimilar nearby resonant frequencies. An ultra-wide bandwidth of 67% for 85% absorption is achieved. The absorber's performance is investigated for transverse electric (TE) and transverse magnetic (TM) polarizations, and with varying incidence and polarization angles. Ultra-wide band performance of the structure for the case of normal incidence changes to multi-band absorption, with increasing the incidence angle. Electric field distribution of the rings for three low, middle and high frequencies in the absorption bandwidth is simulated and graphically demonstrated. The field distribution verifies that the rings with larger dimensions interact more effectively with low frequency electromagnetic waves, and the rings with smaller dimensions have stronger effects on high frequency waves

کلمات کلیدی:

Metamaterial Absorber, Wide-Band Absorber, Planar Metamaterial

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